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| <p>(54) Title: SUPPORT ARRANGEMENT FOR AN ABSORBENT PRODUCT</p> <p>(57) Abstract</p> <p>Support arrangement (1) for an absorbent product. The support arrangement comprises a material strip (3) having first attachment means (8, 9, 18, 20, 27). The first attachment means comprises one part of a releasable fastening means for releasable attachment to a co-operating attachment means (11, 17, 21, 24) on an absorbent product (2, 2a). The first attachment means is in both a front portion and a rear portion of said support arrangement (1). The support arrangement (1) further comprises an article of clothing (31-34) and the material strip (3) is permanently attached to the inside of the article of clothing at the waist region, such that the first attachment means are substantially hidden from view from the side of the article when the article is in its intended position of use on a wearer.</p> |  |   |   |
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Title: Support arrangement for an absorbent product

Field of the invention:

10 The present invention relates to a support arrangement for an absorbent product as defined in the preamble of claim 1 and claim 2. The invention also relates to the combination of a support arrangement and an absorbent product as defined in the preamble of claim 15.

15 In particular the present invention relates to a reusable support arrangement for supporting disposable absorbent products such as diapers, absorbent pads and the like for absorbing human exudate (especially for blood, urine and faeces as well as other exudates which can be released from the urinary and anal orifices), in particular but not exclusively for adult incontinence use. The term "reusable" is intended to mean that the support arrangement is intended to be used more than once after becoming dirty and not merely discarded after each use. Thus, normally, the support arrangement will be of a type which can be worn and, when required, washed one or more times like an item of clothing.

30 A support arrangement of the type defined in the preamble of the independent claims is known in the art of absorbent products for incontinence use. Such a support arrangement comprises a reusable waist belt of non-woven material which is fastened around a user's waist. An absorbent product such as a diaper having releasable attachment means thereon at the front and back is passed between a user's legs and releasably fastened to said belt. Such an arrangement is shown for example in US-A-4 964 860 to Gipson et al.

35

Background to the invention:

One of the major problems suffered by incontinent persons is that the subject of being incontinent is often embarrassing. Thus adults in particular make great efforts  
5 to hide absorbent garments and absorbent garment support arrangements from view. When an absorbent article support arrangement in the form of a belt is used and clothing is worn over the top, there is often a risk that the normal clothing item will move down the person's body during use  
10 and parts of it become visible. Such is undesirable.

Additionally, such a supporting belt is generally firmly fitted to the person's body so that it will not slip down during use. This generally creates two areas of forces on  
15 the body around the waist region, firstly due to the belt itself and secondly due to the waistband of the user's article of clothing which is being worn over the top. Often merely the belt by itself can be uncomfortable, but when added to the force applied by the clothing waistband, the  
20 resulting force is clearly worse.

Further difficulties encountered by incontinent persons are those of changing a soiled article in a minimal amount of time and with ease, as well as adjusting the position of  
25 the waist belt upwardly such that greater comfort is achieved. Where normal articles of clothing are worn, the user often has to undo the entire article of clothing in order to be able to gain access to the absorbent product to be removed, or to gain access to the waist belt. Again,  
30 such is undesirable since this is complicated and may be embarrassing.

One solution directed to the above problems is to make the outer clothing material in one piece with the absorbent  
35 product by connecting the absorbent part and the outer clothing-like layer by heat sealing or sewing at the waist

region. Such an article is known from WO-A-95/18589. The item is a disposable all-in-one article. The disadvantage with such disposable all-in-one articles is that when the article becomes soiled, the user must replace it with a further complete all-in-one article which is both expensive and wasteful. For incontinence sufferers who are not bed-ridden this also involves having to carry a larger replacement article in a handbag or case, compared to when only an absorbent product (and not the outer cloth of a clothing article) is made disposable. Additionally, since such all-in-one products are disposable, the products will normally be made with a relatively cheap garment material for the covering clothing part (i.e. the outer skirt material or shorts material).

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The present invention is aimed at solving one or more of the above-mentioned problems.

20

Further problems which can be solved by this invention with respect to the prior art support arrangements and absorbent products will become apparent to the reader of the following description.

**Summary of the invention:**

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The essential elements of the present invention are defined by the features of claims 1, 2 and 15.

Preferred features of the invention are defined in the dependent claims.

30

Various terminology is used in this specification to explain locations, directions, joints, etc. In order to add clarification to the meaning of the terminology, certain aspects are explained briefly below.

35

5 The term "releasable mechanical fastening means" relates to fastening means which as a result of their shape or construction, releasably attach to a cooperating attachment surface or means. Such releasable attachments imply that the fastening means allows attachment, release and re-attachment, preferably many times.

10 "Hook and loop type" attachment means refers to a particular type of releasable mechanical fastening means where one part of the attachment means is formed by a material surface having generally a large number of very small hook (or loop) elements which cooperate with another co-operating material surface generally having a large number of loop (or hook) elements. An example of such an 15 attachment means is sold under the trade name Velcro®. This type of attachment means does not only include elements which are specifically hook and loop shaped but also other types of surface structures with the same effect (e.g. having a mushroom-like head appearance instead of a hook-like head).

20 These above-mentioned releasable type of connections or attachments are to be understood as distinct from "permanently attached". Permanent attachment refers to a 25 connection between two parts which is not intended to be released. Such connections in respect of this invention comprise for example heat-sealing, sewing or stitching, ultra-sonic welding or other forms of welding, permanent adhesive joints, etc.

30 The "articles of clothing" making up part of the support arrangement of this specification (i.e. shorts, trousers, skirt, dress and the like) are intended to mean articles of clothing which per se are formed without an integral 35 disposable absorbent batt therein.

The "waist region" of an article of clothing is intended to refer to that part of the article which is intended to be at, or proximate to, the user's waist during normal use. Where the article of clothing has no distinct waistband of its own (i.e. in the case of Fig. 4 or 5 to be described later), then the waist region of the article is the generally upper portion of the article close to the upper edge thereof.

10 The term "substantially hidden from view from the side" is intended to refer to a viewpoint to the support arrangement from any location generally above the lowest level of the support arrangement. Thus, using the example of a skirt whilst being worn, the viewpoint may be any point 15 approximately level with the lower edge of the skirt to a point upwards therefrom.

20 The "intended position of use" on a wearer or "position of normal use" are intended to refer when the article is fitted correctly on the user as intended. Thus, this is not intended to refer to the case when the article is fitted inside-out or upside down for example. In this regard, the "inside" of any part is intended to mean the part of said item which faces the user in the normal position of use, 25 whereas "outside" refers to the part of said item facing away from the user in the normal position of use. Similarly, the terms "upper, lower, front and back" refer to the relative locations on an article when in its orientation of intended use. Consequently, the term "front 30 portion" of the support arrangement refers to the general portion of the arrangement which is positioned at the front of the user up to the region of the hips and the "back portion" refers to the portion of the arrangement situated at the back of the user up to region of the hips. Typically 35 the front and back portions of the support arrangement are

joined by a seam in the item of clothing on one or both sides.

**Brief description of the drawings:**

5 The invention will now be explained in more detail with reference to certain non-limiting embodiments thereof and with the aid of the accompanying drawings in which:

10 Fig. 1 is a frontal view of one embodiment of a support arrangement according to the invention, when fitted to a user.

**Fig. 2 to Fig. 10**

15 show various cross-sectional embodiments of the upper portion of support arrangements according to the invention, as seen along line A-A in Fig. 1.

20 Fig. 11 shows an alternative placement and arrangement of material strips with fastening means in a support arrangement according to the invention.

25 Fig. 12 shows a further alternative placement of material strips with fastening means, also combined with an absorbent product fitted inside a support arrangement in accordance with the invention.

30 Fig. 13 shows a still further alternative placement and arrangement of material strips and fastening means according to the invention.

35 Fig. 14 shows an embodiment having material strips with fastening means similar to that in Fig. 12 and further shows the support arrangement in the form of a pair of shorts with an openable waistband and fly.

Fig. 15 shows an absorbent product suitable for use in the support arrangement of the invention.

Fig. 16 Shows an alternative form of absorbent product for  
5 use with the support arrangement of the invention.

Detailed description of preferred embodiments:

Fig. 1 shows a view, from the front, of a person "B" wearing a support arrangement 1 in accordance with the invention, wherein the article of clothing forming part of said support arrangement is in the form of a pair of shorts 31. The shorts have a waistband extending all the way around the arrangement from an upper edge 38 of the shorts 31 to a lower edge 36 beneath. The lower edge 36 of the 10 waistband is determined, in this particular embodiment, by the extent of the elastic element 29 (see Fig. 2).

Fig. 1 also shows, in dashed lines, alternative articles of clothing which may be used with the invention. Thus, line 20 32 denotes the outline of the lower edge of a skirt, the sides of the skirt extending along lines 32a upwardly to the waistband. Similarly, the line 34 denotes the outline of a pair of trousers. The line 33 is intended to denote the general outline of a dress, following lines 32 and 32a 25 for example and extending above the waist band.

The support arrangement is designed to be reusable, preferably many times. Additionally, the support arrangement (which includes the article of clothing) is 30 also designed to be able to be worn without an absorbent garment when one is not needed or desired. Thus a high quality material can be used for the article of clothing, since the article will not normally be disposed of after only one use.

Inside the article of clothing, and attached thereto, is at least one strip of material 3. In the embodiment of Fig. 1 the material strip has an upper edge 35 and a lower edge 37. This strip of material 3 is inside the article of 5 clothing and is permanently attached at line 28 (which may for example be a continuous or intermittent attachment line, or even have connections at different levels). Attachment line 28 is positioned at the waist region of the article of clothing. In this embodiment, a single strip of 10 material 3 extends all the way around the waist region. And is attached by a line 28 all the way around. Thus the strip is present both in the front portion and the rear portion of the support arrangement. The strip itself may also be elasticated and thus be fitted, at least over part of its 15 height, closely around the user's waist region as shown in Fig. 1.

Attachment line 28 is a line of permanent attachment between the shorts 31 and the material strip 3. The 20 material strip is not normally attached to the article of clothing at any further point below the line of attachment 28 and may thus freely drape downwardly (see e.g. Figures 2 to 10). To maintain the position of the strip 3 with respect to the item of clothing and to stop it wrinkling or 25 rolling up, it is however possible to provide one or more fixing or tacking points proximate the bottom edge 37 and the corresponding location on the item of clothing somewhere in the hip regions thereof.

30 The strip 3 is preferably formed by a single strip of non-woven PP material having a surface suitable for the attachment of the hook part of a hook and loop type attachment means. In this way the single material strip forms a type of single piece internal belt attached to the 35 article of clothing, said belt having a continuous surface of loop material of a hook and loop type releasable

fastening means, which surface is available for the attachment of a corresponding hook part positioned on an absorbent product. A cross-sectional view of such an arrangement is shown in Fig. 2. A reusable belt of this 5 general type is known per se from the aforementioned US-A-4 964 860 for example.

Thus, the support arrangement so-described comprises the article of clothing combined with the material strip 3. In 10 this case the material strip itself has one part of the releasable fastening means integrally thereon due to the choice of material. In the position shown in Fig. 1, the support arrangement is ready for the attachment thereto of an absorbent product 2 (such as that shown in Fig. 15 for 15 example). The absorbent product 2 in Fig. 15 will be explained in more detail below, but for explaining its attachment to the support arrangement it suffices here to state that it comprises four hook material patches 11, one 20 at each corner, which are releasably affixed to the material strip 3 on the inside of, and at the front and the back of, the support arrangement 1.

The cross-section in Fig. 2 shows, on the left hand side, the material layer of the shorts 31, having an elasticated 25 material 29 integrated therein at said waistband. Attached thereto by means of a stitched joint 28 is at least one material strip 3. Below the line of attachment 28, the strip 3 is able to drape freely downwardly, although it has been shown angled inwardly for reasons of clarity. The 30 attachment of the strip 3 (or belt if the strip is continuous) is such that the upper edge 38 of the shorts is above the upper edge 35 of the material strip 3 and the lower edge of the shorts 31 is well below the lower edge of the strip 3. Thus, when the support arrangement is worn, 35 the support arrangement will appear from the outside to be an entirely ordinary article of clothing, since when viewed

from the side the attachment means are substantially hidden from view from at least the side thereof. Even when the user's article of clothing sags, the belt (material strip 3) will move down correspondingly at the attachment line 28 5 and thus the belt will not become visible. In this way, there is no requirement to choose a garment-like belt material for the strip or trying to match the colour of the article of clothing to that of the material strip 3.

10 The material strip 3 has an inside surface 8 and an outside surface 9. Either the inside surface 8 or the outside surface 9, or both, may form one part of the releasable attachment means, or one part of the releasable attachment means may be affixed thereto. In Fig. 2 the strip of 15 material 3 is formed as a non-woven belt. The other part 11 (second attachment means) of a releasable attachment means is attached to one end 10, 10' of a diaper. In Fig. 2 the patch 11 is positioned on the impermeable backsheet of the absorbent product and is thus intended to be attached to 20 the inside surface 8 of the material strip 3.

As will be clear, the absorbent product must have corresponding fastening means attached in the front portion and the back portion of the support arrangement such that 25 it may be supported at either end 10, 10' (see Fig. 15).

In Fig. 3, the second attachment means 11 (e.g. made from hook-type material) is attached to the top sheet (i.e. facing or bodyside face of the absorbent garment) and thus 30 is intended to be attached to the outside surface 9 of the material strip 3 as shown. The methods of performing attachment to the support arrangement will be explained later.

35 Fig. 2 also shows an alternative configuration of the belt and waist region of the clothing article. The upper edge 38

of the shorts 31 is positioned at substantially the same height as the upper edge of the material piece 3. Two permanent attachment lines or zones 28, 30 have been used in this embodiment; more or less attachment lines or zones 5 can however be used. Although the upper edge 38 is partially visible, it will move together with the shorts material and thus the support arrangement will be perceived as a normal garment. Even when the top of the shorts is in view, the material strip 3 will merely be perceived as some 10 type of lining material.

No elastication is depicted in any of the embodiments of Fig. 3 to 10. However elastication may be provided in either the material of the article of clothing (e.g. the 15 shorts 31) or the material strip 3 if desired. Elastication need not be provided around the whole waist, since only small portions need be elasticated. Elastication may also be replaced or supplemented by a cord fastener in the waistband or even by an external waist belt for example. 20 However, where elastication or other tightening means is provided in either only the strip 3 or only in the article of clothing, it will be apparent that only one elastication force is experienced by the body around the waist, compared to two separate forces from a separate belt and separate 25 article of clothing as used in the prior art. Thus the comfort of the support arrangement is improved compared to the prior art.

In the embodiment of Fig. 4, the material strip 3 has been 30 folded over the upper waist region of the article of the shorts 31 and secured by a permanent stitching line 28. Thus the material strip (in this case preferably continuous) will form the waistband of the support arrangement.

A similar arrangement to Fig. 4 is shown in Fig. 5, whereby the outside surface material strip is arranged to be either inside or substantially flush (in part thereof) with the shorts 31.

5

In both the arrangements of Figs. 4 and 5, the material strip 3 is firmly attached to the article of clothing and thus will generally appear as a normal article of clothing. However, since the material of the belt might not properly 10 match the material of the clothing article, appropriate colouring may produce a more desirable appearance.

10

Fig. 6 shows an arrangement similar to Fig. 3 with a 15 modification of the releasable attachment means. In this embodiment, the first attachment means part of the releasable attachment means is formed by a patch of hook material 13 (or loop material respectively) on the outside surface of material strip 3. This cooperates with a second attachment means 14 of loop material (or hook material 20 respectively) on one end 15 of an absorbent product 2.

Figs. 7 to 9 show alternative releasable mechanical fastening means.

25

Fig. 7 comprises a button 18 and button-hole 17 arrangement. In this embodiment the button is attached by stitching 19 in the lower part of material strip 3 and the button hole is formed in a part 16 of the disposable absorbent product. Although the arrangement could be 30 reversed, the button being attached to the reusable item is more economic. The button 18 is on the outside of the material strip 3 facing away from the wearer for reasons of comfort and ease of fitting.

35

In Fig. 8 a stud or rivet-type two part mechanical connector is illustrated, the female part 20 being attached

to the strip 3 proximate its lower edge and the male part 21 being attached to an end part 22 of an absorbent product.

5 Fig. 9 shows a two part clip fastening arrangement where each part is a moulded flexible plastics element. The first part on the strip 3 comprises an integral moulding having an arm 27 spaced slightly from a base 27'. The arm 27 can be pivoted about the base by pressing on integrally moulded  
10 lever 26. The second part comprises moulded plastics arm 24 with integral lever portion 24' attached to a portion of the end 23 of a diaper (e.g. by an integral base portion or the like - not shown). The arm 24 has attached at the outer end thereof a projection 25 for cooperation with the  
15 projection on the end of arm 27. When both lever portions are pressed, the clip portions on parts 3 and 23 can engage. Release of the clips is performed by pressing both portions again. Other forms of two component fastening systems will be apparent to a skilled man, such as those  
20 requiring a mechanical force only to be exerted for releasing the means, but not for attachment. Two component systems require that each material part (in this case parts 23 and 3) is each fitted with one part of the two component system. Thus, merely a clamp device attached to one part  
25 which is designed to clamp on to an edge of the material of the other part is not a two component system, but a one component system.

30 In the embodiment of Fig. 10 a further arrangement of the belt and waist region of the article of clothing is shown. Here the upper edge 38 article of clothing 31 is folded around the strip 3 and stitched together.

35 Other possible waist band formations will become apparent to the skilled man.

Fig. 11 shows an alternative embodiment of the invention, in which the at least one material strip 3 is formed as two material strips 4a and 4b, one placed in the back and one in the front portion of the article of clothing. Each of the material strips 4a, 4b has a first attachment means 13 in the form of hook material patches attached to its outer surface. The arrangement is thus similar to that in Fig. 6, with the exception that the upper edge of the material strips 4a, 4b being positioned below the upper edge 38 of the article of clothing.

In Fig. 12, the at least one strip of material 3 is in the form of four strips 5a, 5a', 5b, 5b', two placed at the front and rear of the article of clothing respectively as shown. Each of the strips may for example be formed of a non-woven loop material for engagement with hook patches 14 (see also Fig. 6) on an absorbent product. As can be seen, the absorbent product 2 depicted is attached at the front and the back regions to the attachment means 5a, 5a', 5b, 5b'. The absorbent product may be of any suitable type (see e.g. the types in Fig. 15 and 16) with the correct cooperating attachment means.

Fig. 12 also shows the preferred feature of a readily-openable crutch region in the case of shorts or trousers. In this embodiment buttons 39 joining the back and front parts of the crutch portion along line 40 are used. However other types of crutch opening means may be used such as hook and loop connection types for example, or other types. This openable arrangement greatly facilitates fitting of an absorbent product to the support arrangement according to the invention when the user does not wish to remove the article of clothing itself. This will be explained in more detail below.

In Fig. 13 a further alternative placement of materials strips is shown. Two material strips 6a and 6b are attached around the side portions of the article of clothing with their ends located within the front and rear portions of the article. In this way, four attachment locations are provided for the absorbent product. In order to allow adequate adjustment, the distance "a" between the internal opposed edges of the strips 6a and 6b would typically be of the order of 5 to 25 cm, depending on the product. It must however be ensured that there is sufficient fastening means area of attachment. Thus the strips 6a and 6b will each typically have a length of between 10 and 35 cm and a depth of between 4 and 14 cm for example. The embodiment of Fig. 13 has the further advantage that the attached absorbent product exerts opposed forces on either end of each strip 6a and 6b which helps to stabilise the strips into an extended and thus more comfortable position on the body.

In the embodiment of Fig. 14, four strips 7a, 7b, 7a' and 7b' are used. In this embodiment each strip is provided with its own patch of first attachment means, e.g. means 13 as shown in Fig. 6. Additionally, the shorts are depicted as having a fly portion 41 extending into an openable upper waist band portion 42. An openable crutch portion 43 is also provided.

As will be apparent from Fig. 12 for example, the support arrangement of the invention is adapted to support an absorbent article by attaching its outer ends 10, 10', preferably at four corners thereof. For this purpose, and to provide adjustability in positioning of the product, the first and or second attachment means should extend over a sufficient distance so as to allow adjustment a few centimetres upwards or downwards. In the case where the material of the material strip 3 forms the attachment surface, such as with a non-woven loop material (see e.g.

Fig. 1 and 2), the width of the draped portion of the strip (i.e. below line 28) is preferably between 6 and 12 cm. Other dimensions may also be used however.

5 For fitting an absorbent product to the support arrangement worn by a user, the user can do this without removing or undoing the support arrangement as long as the article of clothing has an openable, or open, crutch region. In the case of a skirt or dress no special opening arrangement is

10 required of course since the lower part is already open. Thus, taking first the example of a skirt support arrangement fitted to a user, and a connection type as in Fig. 3, the user first lifts the skirt from the lower edge upwardly so as to reveal the outside surface 9 of the strip

15 3. The user takes an absorbent product such as that in Fig. 15 and fits each of tabs 11 to surface 9 at the rear which is fairly easily accomplished if the length of surface 9 at the rear of the support arrangement is adequately long (6 to 14 cm for example). With this attachment at one end 10', the absorbent product can be stretched out through the user's legs and then attached at the front waist region with the desired amount of tension. The skirt then merely needs to be lowered back into place.

20

25 The desired amount of tension can be used for providing a good fit for the leg opening elasticated regions 44 and/or for opening-out standing gathers depicted generally at 12. Standing gathers are known per se in the art (see e.g. EP-A-098 512). Thus the advantage of being able to use

30 standing gathers is maintained by this invention, whereas the advantage is lost in the case of prior art articles where the core-containing element of a two-piece product is inserted into underwear and the underwear relied upon to hold the absorbent product in place against the body.

The article of clothing waistband (with integrated material strip 3) supports the absorbent product. This provides significant advantages compared to separate waist belts (e.g. as in US-A- 4 964 860) since adjustment of a sagging diaper can be performed discretely merely by adjusting the waist band of the article of clothing itself, since this is permanently attached thereto. This reduces the possibility of embarrassment for the wearer. Moreover if an article of clothing does move down on the body, this movement will not reveal the upper portions or edges of an attachment belt fitted to the body since the material strip 3 (acting as the attachment belt) will move down at the same time.

A further advantage achieved by the movement of the article of clothing and the absorbent product together is that the article of clothing always protects the absorbent product from abrasion, since the upper edges or the lower parts of the absorbent product sheets are not exposed outside the article of clothing.

Furthermore, due to the fact that the article of clothing of the support arrangement does not need to be fully removed when fitting an absorbent product, the time taken for fitting or changing an absorbent product can be reduced and there is also less danger of the user's article of clothing becoming dirty as a result of clothing removal when the clothing items may fall down on to floors that are dirty (e.g. in toilets). Additionally, by removal of a soiled absorbent product from below (by adopting the fitting steps in reverse order), there is little danger of soiling the article of clothing itself when actually withdrawing the absorbent product. This can be compared to removing a soiled diaper through the top of the article of clothing whereby not only does the clothing article have to be lowered from the waist, but also there is a risk of

bodily exudate being released or spilled from the diaper onto the clothing item.

5 For users wearing shorts and not a skirt or dress, a similar convenient fitting and removal possibility can be obtained if the crutch region is made openable as in Fig. 12 for example. The user merely has to undo the fastening arrangement and draw up the front and rear part of the shorts to gain access in the same way as with a skirt. With  
10 longer trousers additional opening means may be required such as a fly 41 and openable waist band 42 such that the opening allowed by the crutch fastening arrangement creates enough space for accessing the fastening means and also for removal of an absorbent product therefrom.

15 Whatever the article of clothing chosen, the article can be made to appear quite normal from the outside and indeed would be normal without the strips of material 3 which are specially constructed or adapted to be a part of releasable  
20 attachment means and fitted in a specific way. This allows the support arrangement also to be worn by non-incontinence sufferers of course. Due to the re-usability of the support arrangement, use of expensive materials is economically possible.

25 As will be apparent from the foregoing, the present invention also allows the possibility of the absorbent product to be fitted from above, or changed with the article of clothing removed or lowered, in addition to the  
30 method described above. Such can be made easier with a releasable connection arrangement between the absorbent product and the support arrangement of the type shown in Fig. 2 for example.

35 Thus, the support arrangement of the invention, and the combination thereof with suitable absorbent products,

offers many advantages to incontinence sufferers which help to reduce embarrassment and ease fitting and removal of absorbent products.

5 Examples of absorbent garments suitable for use with the support arrangement of the invention are shown in Fig. 15 and Fig. 16.

10 The absorbent garment of Fig. 15 comprises a top pervious sheet 46 (visible side in Fig. 15) and an impervious backsheet 47, with an absorbent core 45 therebetween. Leg opening elastication 44 may be integrated into the product and/or standing gather arrangements 12 which generally run in line with, the central longitudinal axis X-X of the absorbent product, as shown. Second attachment means 11 are preferably provided at four or more separate locations (at each corner) on the absorbent product on the top sheet side of the product, at locations proximate (i.e. within one to three centimetres, for example) of the longitudinal side edges 53, 54 of the product and with a similar proximity to the end edges 10 and 10'. The attachment means 11 may however be affixed to the upper side of the backsheet 47, for example by making this larger than the top sheet 46. This may be of advantage to prevent tearing since backsheets are generally more durable than permeable top sheets.

20 Further different arrangements of the second attachment means can be used and these will be readily apparent to a skilled man. A diaper construction of the general type shown in Fig. 15 is already generally known in the art and the material selections used may vary widely. The absorbent product must however be specially adapted with second fastening means which co-operate with the first fastening means of the at least one material strip 3 in the support arrangement.

As will also be clear, the length of absorbent product or fitment thereof which is suitable for use with the support arrangement should also be chosen such that the article of clothing will substantially hide the absorbent product when fitted, from view from the side when the article is in its intended position of use. With shorts or trousers this presents no problem since the absorbent product is enclosed. This is important to avoid the absorbent article being seen, since with the invention no separate adjustment of the belt (material strip 3) with respect to the article of clothing is intended.

The diaper shown in Fig. 16 is merely one example of an alternative type to that in Fig. 16 and instead uses a central absorbent structure of any suitable type attached to four bands of material 48, 49, two at either end of the absorbent product. Each end of the bands 48, 49 is provided with a second attachment means 51, 52 of suitable material or construction (see examples in Figs. 2 to 10). With this embodiment, where the attachment means 51, 52 are part of a hook and loop connection type for use in the arrangement of Fig. 2 or Fig. 3 for example, the bands may be turned along their length to allow fitting to either the inside 8 or outside 9 of the material.

Although the use of mechanical fastening means is most suitable, the use of adhesive tape fastening means could be imagined, with for example an adhesive second fastening means on the absorbent product cooperating with an appropriate durable and smooth surface on the support arrangement (e.g. a durable smooth plastics film attached to a material strip 3).

Nevertheless, whichever cooperating arrangement is to be used, it is important that the connection force between the first and second fastening means be sufficient to maintain

safe positioning of the absorbent garment on the user . At the same time the force should still be low enough to allow removal without excessive force. Suitable ranges for the connection forces when two-part peelable connections are used (e.g. hook and loop type connections) would be with peel strengths between 0.1 and 2.0 Ncm<sup>-1</sup> and shear strengths greater than about 3 Ncm<sup>-2</sup> up to 20 Ncm<sup>-2</sup>. The choice of appropriate peel and shear strengths can be chosen by the skilled man.

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Although the invention has been described above with reference to several preferred embodiments thereof, the scope of the invention is not limited thereto but is instead defined by the full scope of the appended claims.

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For instance, the articles of clothing may be provided with opening arrangements allowing them to be opened completely along one or more sides and/or down the rear portions thereof.

## CLAIMS

1. Support arrangement (1) for an absorbent product (2, 2a) such as a diaper, wherein said support arrangement is adapted for encircling a user's waist and comprises at least one material strip (3) having first attachment means (8, 9), said first attachment means comprising one part of a hook and loop type releasable mechanical fastening means for releasable attachment to a co-operating attachment means (11; 14) positioned on said absorbent product (2, 2a), said first attachment means being present in both a front portion and a rear portion of said support arrangement, **characterized in that** said support arrangement further comprises an article of clothing selected from the group of articles having a waist region and consisting of shorts (31), trousers (34), skirt (32) and dress (33), and in that said at least one material strip (3) is permanently attached (28) to the inside of said article of clothing at said waist region, such that the first attachment means are substantially hidden from view from the side of the article when the article is in its intended position of use on a wearer.
  
2. Support arrangement (1) for an absorbent product (2) such as a diaper, wherein said support arrangement is adapted for encircling a user's waist and comprises at least one material strip (3) having first attachment means, said first attachment means (18, 20, 27) comprising one part of a releasable mechanical fastening means from the group consisting of button and hole fasteners (17, 18), press-stud fasteners (20, 21), cooperating two-part clip fasteners (27, 24) and other two component fastening systems, for releasable attachment to a co-operating attachment means (17, 21, 24) positioned on said absorbent product (2, 2a), said first attachment means being present

in both a front portion and a rear portion of said support arrangement, **characterized in that** said support arrangement further comprises an article of clothing selected from the group of articles having a waist region and consisting of 5 shorts (31), trousers (34), skirt (32) and dress (33), and in that said at least one material strip (3) is permanently attached (28) to the inside of said article of clothing at said waist region, such that the first attachment means (18, 20, 27) are hidden from view from the side of the 10 article when the article is in its intended position of use on a wearer.

3. Support arrangement according to claim 1 or claim 2, **characterized in that** said at least one material strip (3) is a single piece belt extending around the waist region of 15 the article of clothing.

4. Support arrangement according to claim 1 or claim 2, **characterized in that** said at least one material strip is 20 constituted by two or more strips (4a, 4b; 5a, 5a', 5b, 5b', 6a, 6b, 7a, 7a', 7b, 7b') attached on the inside of said article of clothing, each of said strips being formed with a first releasable attachment means (8, 9, 13) and each of said strips permanently attached (28) to the inside 25 of said article of clothing at said waist region, such that the first attachment means on each of said strips is hidden from view when the article is in its intended position of use on a wearer.

30 5. Support arrangement according to claim 4, **characterized in that** said at least one material strip (3) comprises two materials strips (6a, 6b), positioned on opposite side portions of the article of clothing, said two strips thus being separated at the front and rear portions of said 35 support arrangement.

6. Support arrangement according to any one of claims 1 or 3 to 5, **characterized in that** the first attachment means comprises non-woven material, to which a hook element fastening means of said hook and loop type releasable fastening means can be attached.

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7. Support arrangement according to claim 6, **characterized in that** said at least one material strip (3) comprises a non-woven material as its outer surface to thereby itself form said first attachment means.

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8. Support arrangement according to any one of the preceding claims, **characterized in that** said at least one material strip is elasticated, the attachment of said at least one elasticated material strip to said waist region thereby forming an elasticated waist region for said support arrangement.

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9. Support arrangement according to any one of the preceding claims, **characterized in that** said at least one material strip is attached to said article of clothing such that an area of said at least one strip, from the lower edge (37) thereof up to the location of permanent attachment (28, 30) of said at least one strip to said article of clothing, forms a zone of non-attachment to said article of clothing, thus allowing said area to drape freely from said location of permanent attachment (28, 30), said first attachment means being formed on a side of said at least one strip which constitutes the side (8) facing away from a user when the support arrangement (1) is in its intended position of use on a wearer.

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10. Support arrangement according to any one of the preceding claims, **characterized in that** said article of clothing has a crutch region, and in that said article has a releasable fastening means (39, 40, 43) in said crutch

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region for releasably attaching together a plurality of parts forming said crutch region to thereby provide a wide opening in said article through which said first attachment means can be accessed.

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11. Support arrangement according to any one of the preceding claims, **characterized in that** said article of clothing has a waist region with an upper edge (38), and said at least one material strip (3) has an upper edge (35), said upper edge of said article of clothing being positioned above the upper edge of said at least one material strip (3).

10

12. Support arrangement according to any one of claims 1 to 10, **characterized in that** said article of clothing has a waist region with an upper edge (38), and said at least one material strip (3) is elasticated and has an upper edge (35), said upper edge of said article of clothing being positioned below said upper edge (38) of said at least one material strip, such that the support arrangement has an elasticated waist band formed by virtue of the elasticity of said elasticated material strip (3) alone.

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13. Support arrangement according to any one of claims 1 to 10, **characterized in that** said article of clothing has a waist region with an upper edge (38), and said at least one material strip has an upper edge (35), said upper edge of said article of clothing being positioned substantially at the same level as the upper edge of said at least one material strip.

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14. Support arrangement according to any one of the preceding claims, **characterized in that** said support arrangement comprises a waist opening arrangement (42) therein.

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15. Combination of a support arrangement (1) for an absorbent product such as a diaper, and said absorbent product (2, 2a), wherein said support arrangement is adapted for encircling a user's waist and comprises at 5 least one material strip having first attachment means (8, 9, 18, 20, 27) said first attachment means comprising one part of a releasable fastening means, and wherein said absorbent product (2, 2a) has second attachment means (11, 10 14, 17, 21, 24, 51, 52) positioned thereon for cooperating for releasable fastening with said first attachment means (8, 9, 18, 20, 27), said first attachment means being present in both a front portion and a rear portion of said support arrangement, **characterized in that** said support arrangement further comprises an article of clothing 15 selected from the group of articles having a waist region and consisting of shorts (31), trousers (34), skirt (32) and dress (33), and in that said at least one material strip (3) is permanently attached (28, 30) to the inside of said article of clothing at said waist region, such that 20 the first attachment means and the absorbent product are substantially hidden from view from the side when the article is in its intended position of use on a wearer.

16. Combination as claimed in claim 15, **characterized in** 25 **that** said support arrangement (1) is formed in accordance with any one of claims 1 to 15.

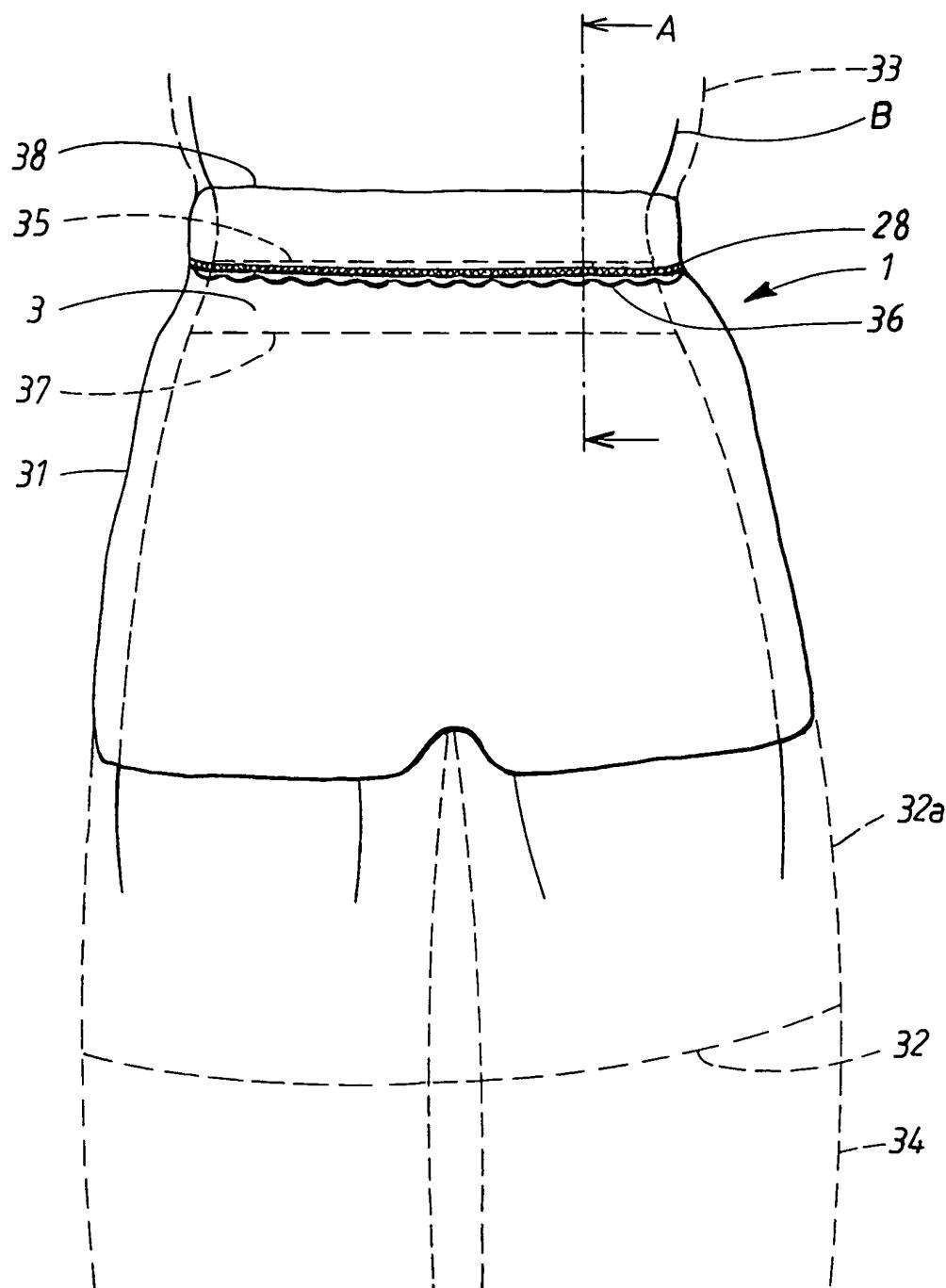
17. Combination according to claim 15 or claim 16, **characterized in that** the absorbent product (2) of said 30 combination has two longitudinal edges and two ends (10, 10a) and in that it comprises a top sheet (46) of fluid permeable material, a back sheet (47) of fluid impermeable material and an absorbent core (45) therebetween, said absorbent product having second attachment means (11, 51, 35 52) at each end of said product, and in that said second attachment means (11, 14, 17, 21, 24, 51, 52) are provided

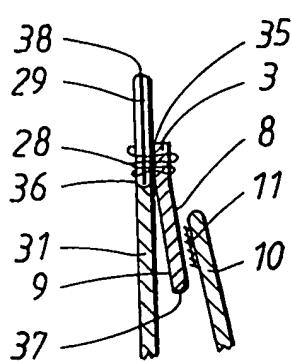
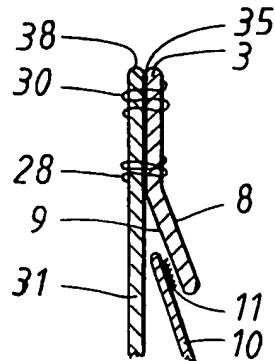
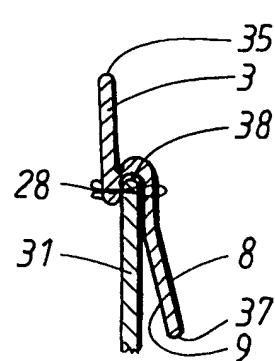
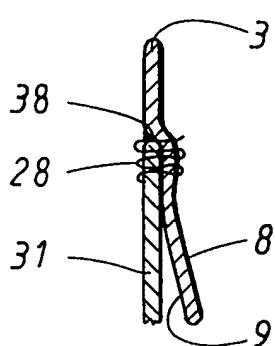
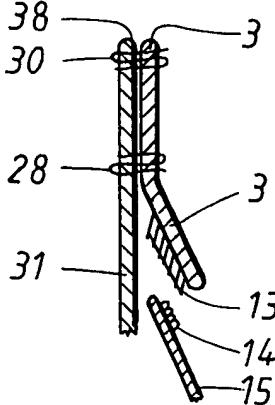
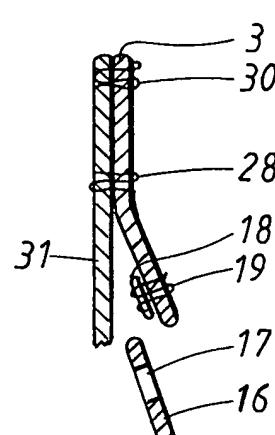
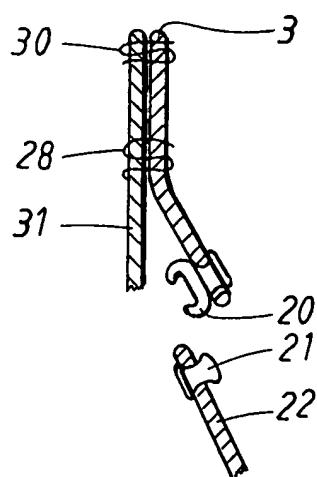
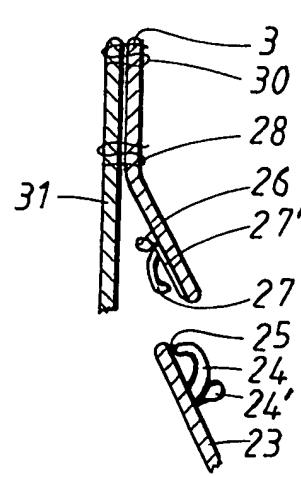
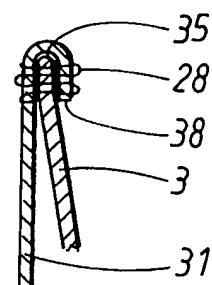
at each end (10, 10') of said absorbent product and are positioned proximate to each of said longitudinal edges (53, 54) and each end (10, 10') of said product.

5 18. Combination according to any one of claims 15 to 17, characterized in that said absorbent product is provided with standing gathers (12) running generally in line with said longitudinal edges (53, 54) and spaced inwardly therefrom towards a central longitudinal axis (X-X) of said  
10 absorbent product (2, 2a).

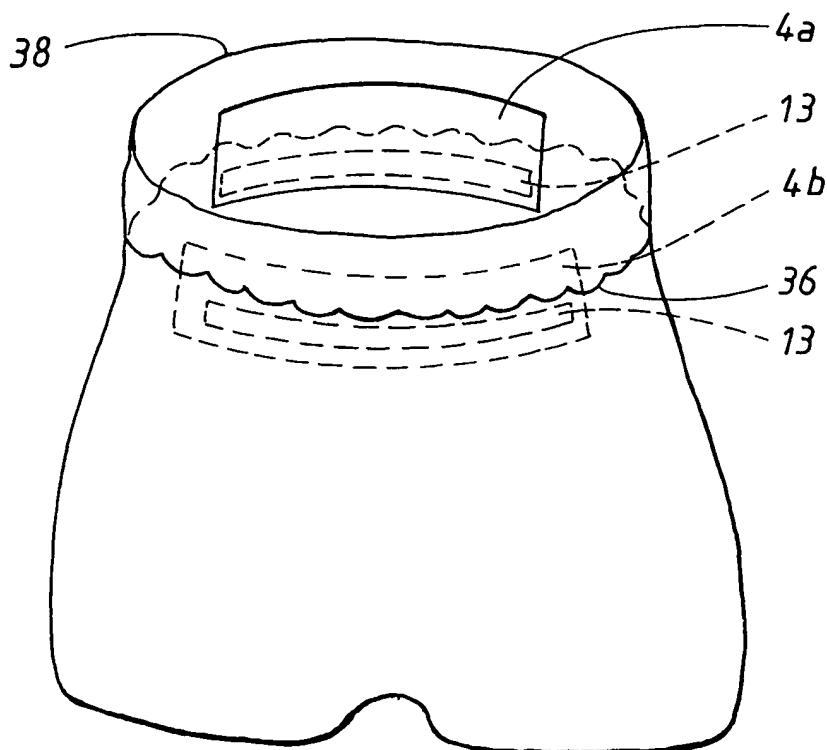
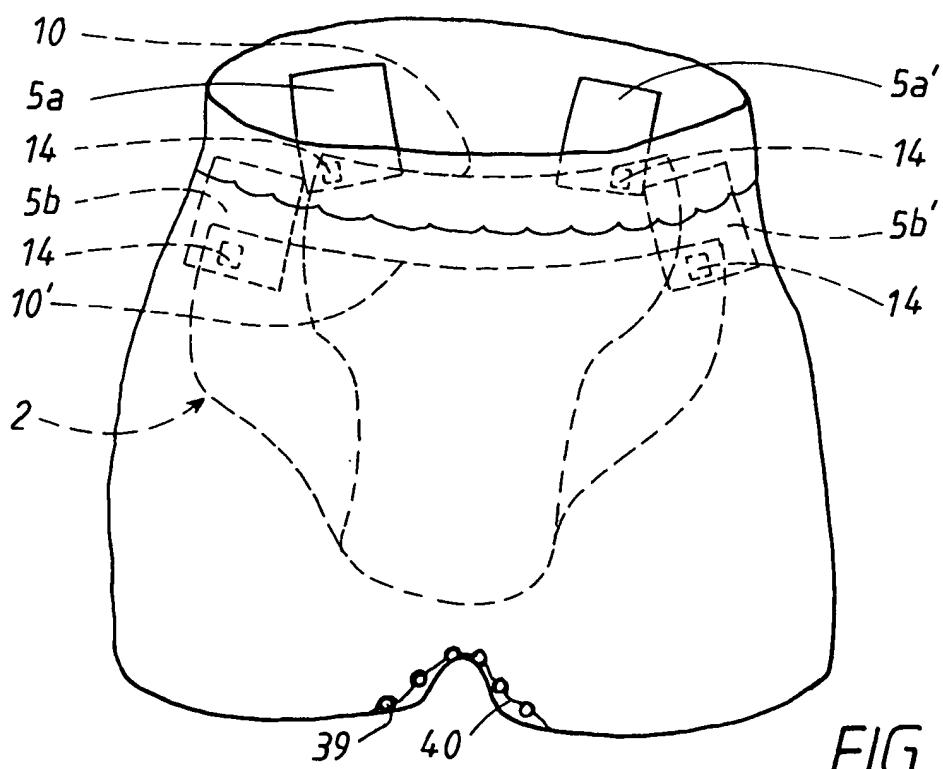
19. Combination according to any one of claims 15 to 18, characterized in that said absorbent product is provided with elasticated leg opening portions (44).

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FIG.1

FIG. 2FIG. 3FIG. 4FIG. 5FIG. 6FIG. 7FIG. 8FIG. 9FIG. 10

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FIG. 11FIG. 12

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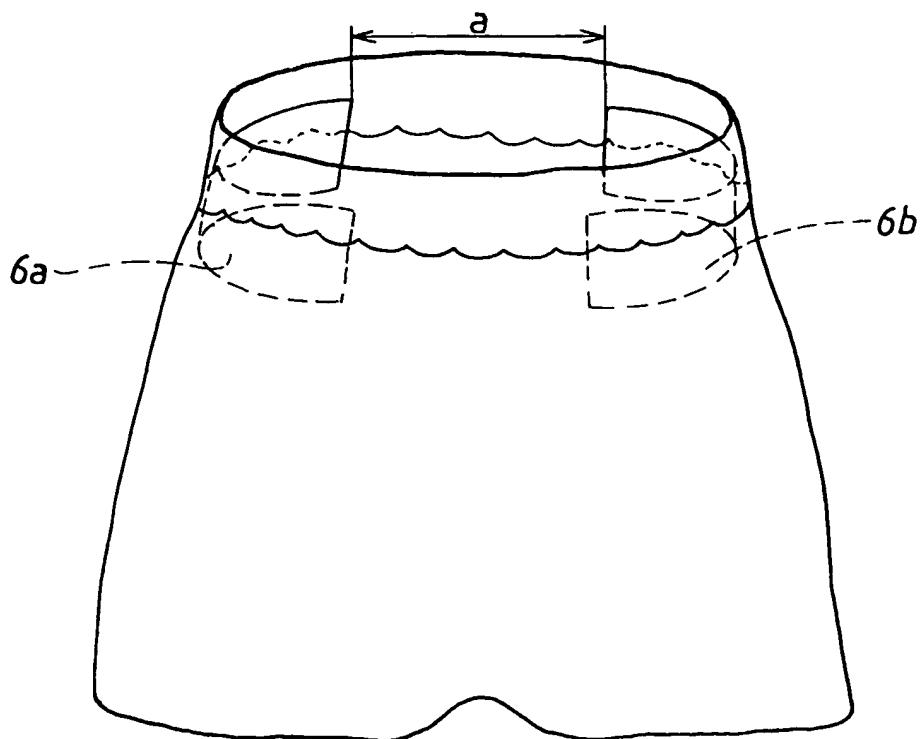


FIG. 13

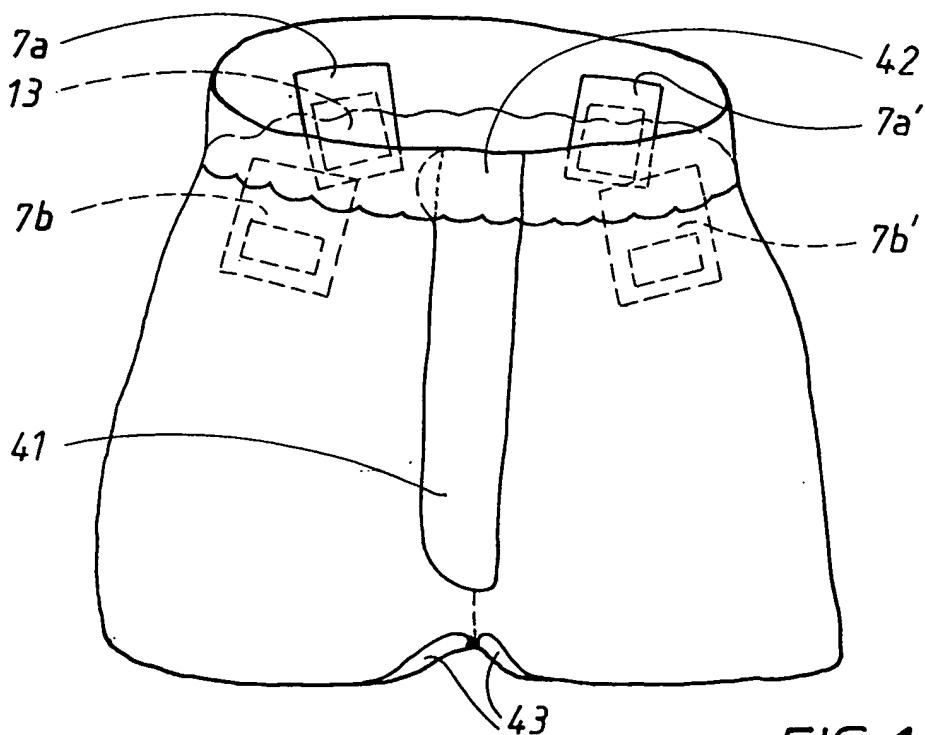
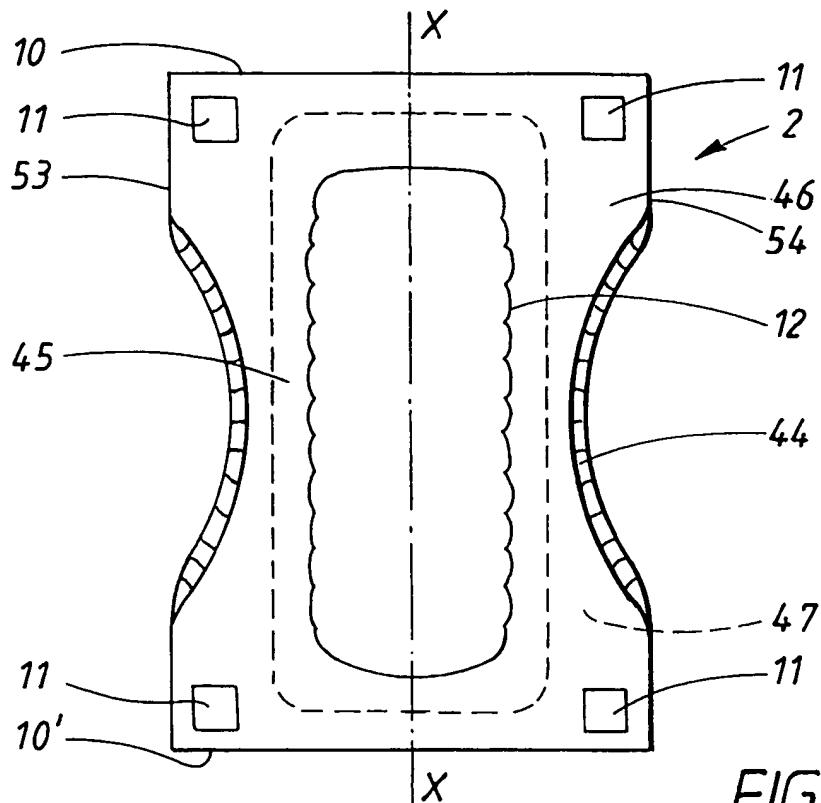
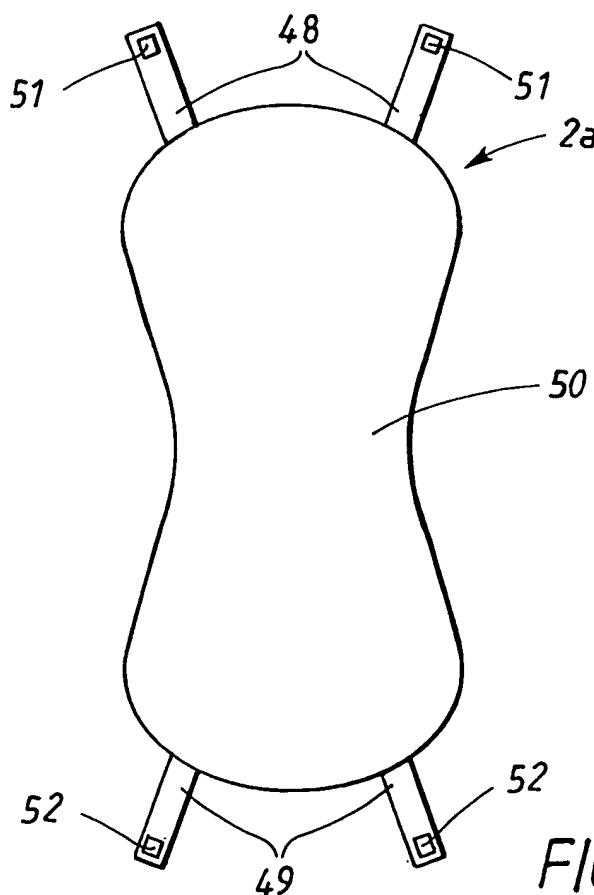


FIG. 14

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FIG. 15FIG. 16

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 98/00946

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A61F 13/72

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.   |
|-----------|--|-------------------------|
| Y         | US 5669902 A (SILVILICH), 23 Sept 1997 (23.09.97),<br>column 2, line 32 - line 34; column 2,<br>line 65 - column 3, line 3, figures 2,3,<br>abstract<br>-- | 1,2,4-8,11,<br>13-19    |
| Y         | US 4280230 A (LAFLEUR), 28 July 1981 (28.07.81),<br>column 1, line 51 - column 2, line 11<br>--  | 1,2,4-8,11,<br>13,15-19 |
| Y         | US 2428881 A (J.J. KISPERT), 14 October 1947<br>(14.10.47), column 3, line 36 - line 39, figure 1<br>--<br>-----   | 2,4,5,8,11,<br>14-18    |

 Further documents are listed in the continuation of Box C. See patent family annex.

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Date of mailing of the international search report

1 Sept 1998

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

27/07/98

International application No.

PCT/SE 98/00946

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|--|------------------|-------------------------|------------------|
| US 5669902 A                           | 23/09/97         | CA 2197147 A            | 25/12/97         |
| US 4280230 A                           | 28/07/81         | NONE                    |                  |
| US 2428881 A                           | 14/10/47         | NONE                    |                  |